

ply. Hence, a functional sensitive oral sphincter may be reconstructed even after resection of a large portion of the lip.

MARK E. KRUGMAN, MD

REFERENCES

- Wood-Smith D: Techniques for the repair of defects of the lips and cheeks, *In* Converse JM (Ed): *Reconstructive Plastic Surgery*, Vol 3. Philadelphia, W. B. Saunders Co., 1977, pp 1544-1578
- Karapandzic M: Reconstruction of lip defects by local arterial flaps. *Br J Plast Surg* 27:93-97, Jan 1974
- Jabaley ME, Orcutt TW, Clemet RL: Applications of the Kara principle of lip reconstruction after excision of lip cancer. *Am J Surg* 132:529-532, Oct 1976

Recent Advances in Maxillofacial Operations

THE MAJOR ADVANCES in maxillofacial surgical procedures for trauma in the past few years have resulted from progress in craniofacial operations. The exposure of the forehead, orbits, zygomatic arches, and upper maxilla and nose made possible via the bitemporal, coronal incision is incredible. Through such an exposure, acute deformities of the upper orbital and forehead area as well as comminuted fractures of the frontal sinus and glabella including "telacanthus" can be reduced and stabilized. The exposure for certain craniofacial separations is excellent. Bone grafting, which in general has been left to secondary procedures in the past, can often be completed so that secondary steps in reconstruction can be obviated. The approach to the upper orbit via the bitemporal incision and via the conjunctival approach to the lower orbit has the additional advantage of less obvious incisions. Similarly, such exposures can be used for late reconstructive procedures.

For congenital problems the most recent improvements in craniofacial surgical procedures have been in reconstruction of certain anterior skull and supraorbital problems in neonates—in general, operation being carried out when the patient is between three and six months of age. At this time there is rapid skull development secondary to growth of the brain. This brain growth can be used to help obtain better skull contour, particularly in cases of plagiocephaly (unilateral cranio-synostosis). Such surgery in Crouzon and Apert syndromes has been less encouraging. New methods for forehead reconstruction have been carried out not only at these early stages but also in the teenage years. A recent advance in forehead osteotomies by Marchac in Paris is very encouraging. He has transposed segments of the anterior skull to create supraorbital rims and better shaped foreheads. Through the use of prefabricated methyl methacrylate im-

plants, we have been able to develop excellent anterior skull contour with protection of the orbits and with minimal morbidity and risk.

There is a great deal of concern by physicians about malpractice from orbital exploration in cases of "blow-out" fracture. In the publications of Putterman, the complications, particularly blindness, reported by him from orbital exploration have caused confusion. This was put into better perspective by the presentation of John Converse at the 1977 annual meeting of the American Society of Plastic and Reconstructive Surgeons in San Francisco. He reported that in his and Byron Smith's series of more than 500 cases of orbital explorations for blow-out fractures there were no cases of blindness. (Other less severe complications could be minimized by careful surgical manipulation and avoidance of excessive retraction.) To generalize and state that in no cases of blow-out fracture should exploration be done is as unacceptable as saying that exploration should be done in all cases. The need for individual treatment of each patient was stressed. Converse pointed out again that, contrary to the opinion of Putterman, the late reconstruction of the enophthalmic orbit is a most difficult and disappointing problem. Close collaboration between plastic surgeons and ophthalmologists is encouraged for the benefit of all, particularly patients.

DOUGLAS K. OUSTERHOUT, MD, DDS

REFERENCES

- Hoffman HJ, Mohr G: Lateral canthal advancement of the supraorbital margin—A new corrective technique in the treatment of coronal synostosis. *J Neurosurg* 45:376-381, Oct 1976
- Whitaker LA, Schut L, Kerr LP: Early surgery for isolated craniofacial dysostosis. *Plast Reconstr Surg* 60:575-581, Oct 1977

Microvascular Reconstruction

WITH INCREASED PROFICIENCY in the techniques of microvascular anastomosis, and success rates greater than 90 percent, the application of this specialized form of surgical operation has extended into the treatment of acute injuries and the reconstruction of posttraumatic and postsurgical deformities.

Patients sustaining traumatic amputation of limbs or digits can be rapidly transferred to centers where microvascular surgical teams are available. The amputated parts are transported in iced saline solutions with the patient. Reimplantation is effected by microdissection of 1.0 mm in diameter donor and recipient vessels using binocular loupes or the operating microscope. Microvascu-

lar repairs are then made using #10-0 or #11-0 nylon sutures under 16 to 25 powers of magnification. Vein grafts are used to bridge vascular defects resulting from crush or avulsion injuries. At the same time, nerve repairs, bone stabilization and tendon repairs are carried out. Post-operative care includes the use of intravenous dextran, occasional heparinization and orally given aspirin. This technique has also been applied to replantation of avulsed scalps, and to transplantation of digits, such as thumb reconstruction by free transfer of a great toe.

Microvascular surgical procedures may benefit those patients with congenital or acquired deformities in whom more classical reconstructive procedures are not applicable or have failed. Full thickness flaps of tissue based on known arterial supply have been successfully transferred by microanastomoses of small arteries and veins. The free groin flap is used commonly in this type of reconstruction and has been employed in the reconstruction of upper and lower extremity soft tissue defects, in repair of facial defects and in breast reconstruction following mastectomy. The groin flap is based upon the superficial circumflex iliac artery. Its course may be preoperatively mapped with a Doppler probe. If suitable recipient vessels can be isolated at the site of proposed reconstruction, the flap can be transferred and anastomoses carried out under magnification.

MICHAEL L. BROWNSTEIN, MD

REFERENCES

- O'Brien BM: Microvascular Reconstructive Surgery. Edinburgh, London and New York, Churchill Livingstone, 1977
O'Brien BM: Replantation surgery. Clin Plast Surg 1:405-426, Jul 1974

Soft Tissue Augmentation With Injectable Collagen

LONG-TERM SOFT TISSUE AUGMENTATION has been achieved by injection of a modified xenogeneic collagen. Studies in rats and rabbits have indicated acceptance of both allogeneic and xenogeneic collagen from human, bovine, rat and rabbit donors. Human clinical trials have been in progress for more than a year.

Dermal collagen is made soluble by controlled digestion with pepsin, a procedure known to reduce antigenicity by removal of nonhelical terminal extensions of the molecule. After purification, an extrudable collagen gel is prepared in physiologic buffer.

After subcutaneous injection the collagen polymerizes as a firm white gel. Within hours there is

a pleocytotic reaction. By three days this evolves to fibroblastic colonization and subsequent vascularization of the injected collagen. Over two to twenty weeks, the cellular and vascular distribution approaches the appearance of dense, but clinically soft, connective tissue. Scanning electron micrographs show randomly arrayed, small diameter collagen fibers.

A clinical study of soft tissue augmentation by allogeneic and xenogeneic (bovine) collagen injection has been carried out in 28 patients involving more than 600 individual injections. Contour defects or depressed scars were due to acne, trauma or subcutaneous atrophy; and injections were both intradermal and subdermal. Of 28 patients, there was moderate to pronounced improvement in 24, with follow-up periods exceeding one year. Complications include one allergic reaction and two instances of cellulitis.

Pepsin-modified xenogeneic collagen appears, therefore, to be a promising biomaterial for long-term tissue augmentation.

TERRY R. KNAPP, MD
JOHN R. DANIELS, MD
ERNEST N. KAPLAN, MD

REFERENCES

- Knapp TR, Luck E, Daniels JR: Behavior of solubilized collagen as a bioimplant. J Surg Res 23:96-105, Aug 1977
Knapp TR, Kaplan EN, Daniels JR: Injectable collagen for soft tissue augmentation. Plast Reconstr Surg 60:398-405, Sep 1977

Treatment of Basal Cell Carcinoma

BASAL CELL CARCINOMA of the skin is the most common and, at times, one of the most frustrating of skin tumors. It occurs most often in persons over 40 years old and has many causes. It is seen most frequently on the head and neck and other exposed areas of the body. The choice of treatment of basal cell carcinoma depends on the type, size and location of the lesion, as well as the age and health of the patient. Previous treatment must be kept in mind when managing recurrent lesions.

The superficial and early ulcerated lesions respond well to a variety of treatments. Electrodesiccation and curettage, liquid nitrogen, chemotherapy with 5-fluorouracil, radiation and surgical excision have been used. Methods which produce a specimen for pathologic study and termination of tumor-free margins are preferred.

Nodular basal cell carcinoma is less invasive than the ulcerated variety and can be completely excised surgically without difficulty if treated early. The morphea or sclerosing types have very